AMIMAX E- amikacin sulfate solution
Bayer HealthCare LLC

Amimax™ E Solution 250 mg/ml

Generic Section

NDC 0859-2359-01

AmiMax™ E Solution 250mg/mL

(amikacin sulfate)

Veterinary Solution

Equivalent to 250 mg amikacin per mL

Caution: Federal law restrict this drug to use by or on the order of a licensed veterinarian

NOT FOR HUMAN USE

KEEP OUT OF REACH OF CHILDREN

Net Contents: 12 gram-48mL

ANADA 200-181, Approved by FDA

Each mL contains:

Amikacin, USP (as the sulfate) ..... 250 mg

Sodium citrate, USP (as buffer)..... 25.1 mg

Sodium bisulfite, USP ..... 6.6 mg

Benzethonium chloride, USP (as preservative) ..... 0.1 mg

Water for injection, USP .....q.s.

pH adjusted with sulfuric acid

Dosage: 2 grams (8 mL) in 200 mL 0.9% sodium chloride injection, USP.

FOR INTRAUTERINE USE

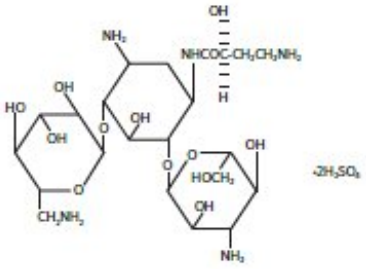
IN THE HORSE ONLY

Read Label Insert

Product of China

DESCRIPTION

Amikacin sulfate is a semi-synthetic aminoglycoside antibiotic derived from kanamycin. It is $C_{22}H_{43}N_5O_{13} \cdot 2H_2SO_4$, D-streptamine, O-3-amino-3-deoxy-α-D-glucopyranosyl-(1→6)-O-[6-amino-6-deoxy- α - D-glucopyranosyl-(1→4)]-N1-(4-amino-2-hydroxy-1-oxobutyl)-2-deoxy-, (S)-, sulfate (1:2)(salt).



The dosage form supplied is a sterile, colorless to light straw-colored solution. The solution contains, in addition to amikacin sulfate, USP, 2.5% sodium citrate, USP with pH adjusted to 4.5 with sulfuric acid and 0.66% sodium bisulfite added. The multi-dose 12 gram -48 mL vial contains 0.01% benzethonium chloride, USP as a preservative.

ACTION

Antibacterial Activity

The effectiveness of AmiMax™ E Solution (amikacin sulfate) in infections caused by *Escherichia coli*, *Pseudomonas* sp and *Klebsiella* sp has been demonstrated clinically in the horse. In addition, the following microorganisms have been shown to be susceptible to amikacin *in vitro*[1], although the clinical significance of this action has not been demonstrated in animals:

Enterobacter sp

Proteus mirabilis

Proteus sp (indole positive)

Serratia marcescens

Salmonella sp

Shigella sp

Providencia sp

Citrobacter freundii

Listeria monocytogenes

Staphylococcus aureus (both penicillin-resistant and penicillin-sensitive)

The aminoglycoside antibiotics in general have limited activity against gram-positive pathogens, although *Staphylococcus aureus* and *Listeria monocytogenes* are susceptible to amikacin as noted above.

Amikacin has been shown to be effective against many aminoglycoside-resistant strains due to its ability to resist degradation by aminoglycoside inactivating enzymes known to affect gentamicin, tobramycin and kanamycin[2].

CLINICAL PHARMACOLOGY

Endometrial Tissue

Concentrations

Comparisons of amikacin activity in endometrial biopsy tissue following intrauterine infusion with that following intramuscular injection of amikacin sulfate in mares demonstrate superior endometrial tissue concentrations when the drug is administered by the intrauterine route. Intrauterine infusion of 2 grams AmiMax™ E Solution (amikacin sulfate) daily for three consecutive days in mares results in peak concentrations typically exceeding 40 mcg/g of endometrial biopsy tissue within one hour after infusion. Twenty-four hours after each treatment amikacin activity is still detectable at concentrations

averaging 2 to 4 mcg/g. However, the drug is not appreciably absorbed systemically following intrauterine infusion. Endometrial tissue concentrations following intramuscular injection are roughly parallel, but are typically somewhat lower than corresponding serum concentrations of amikacin.

Safety

AmiMax™ E Solution (amikacin sulfate) is non-irritating to equine endometrial issue when infused into the uterus as directed (see "Dosage and Administration"). In laboratory animals as well as equine studies, the drug was generally found not to be irritating when injected intravenously, subcutaneously or intramuscularly. Although amikacin, like other aminoglycosides, is potentially nephrotoxic, ototoxic and neurotoxic, parenteral (intravenous) administration of amikacin sulfate twice daily at dosages of up to 10 mg/lb for 15 consecutive days in horses resulted in no clinical, laboratory or histopathologic evidence of toxicity. Intrauterine infusion of 2 grams of amikacin sulfate 8 hours prior to breeding by natural service did not impair fertility in mares. Therefore, mares should not be bred for at least 8 hours following uterine infusion.

INDICATIONS AND USAGE

AmiMax™ E Solution (amikacin sulfate) is indicated for the treatment of uterine infections (endometritis, metritis and pyometra) in mares, when caused by susceptible organisms Including *Escherichia coli*, *Pseudomonas* sp and *Klebsiella* sp. The use of amikacin sulfate in eliminating infections caused by the above organisms has been shown clinically to improve fertility in infected mares.

While nearly all strains of *Escherichia coli*, *Pseudomonas* sp and *Klebsiella* sp, including those that are resistant to gentamicin, kanamycin or other aminoglycosides, are susceptible to amikacin at levels achieved following treatment, it is recommended that the invading organism be cultured and its susceptibility demonstrated as a guide to therapy. Amikacin susceptibility discs, 30 mcg, should be used for determining *in vitro* susceptibility.

DOSAGE AND ADMINISTRATION

For treatment of uterine infections in mares, 2 grams (8 mL) of AmiMax™ E Solution (amikacin sulfate), mixed with 200 mL 0.9% Sodium Chloride Injection, USP and aseptically infused into the uterus daily for three consecutive days, has been found to be the most efficacious dosage.

CONTRAINDICATIONS

There are no known contraindications for the use of amikacin sulfate in horses other than a history of hypersensitivity to amikacin.

PRECAUTIONS

Although AmiMax™ E Solution (amikacin sulfate) is not absorbed to an appreciable extent following intrauterine infusion, concurrent use of other aminoglycosides should be avoided because of the potential for additive effects.

ADVERSE REACTIONS

No adverse reactions or other side effects have been reported.

WARNINGS

Do not use in horses intended for human consumption. *In vitro* studies have demonstrated that when sperm are exposed to the preservative which is present in the 48 mL vials (250 mg/mL) sperm viability

is impaired.

HOW SUPPLIED

AmiMax™ E Solution (amikacin sulfate) is supplied as a colorless solution which is stable at room temperature. At times the solution may become pale yellow in color. This does not indicate a decrease in potency. 48 mL vial, 250 mg/mL

STORAGE AND HANDLING

Store at controlled room temperature 20°-25°C (68°-77°F).

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Manufacture d for Bayer HealthCare LLC Shawnee Mission, KS 66201

Product of China

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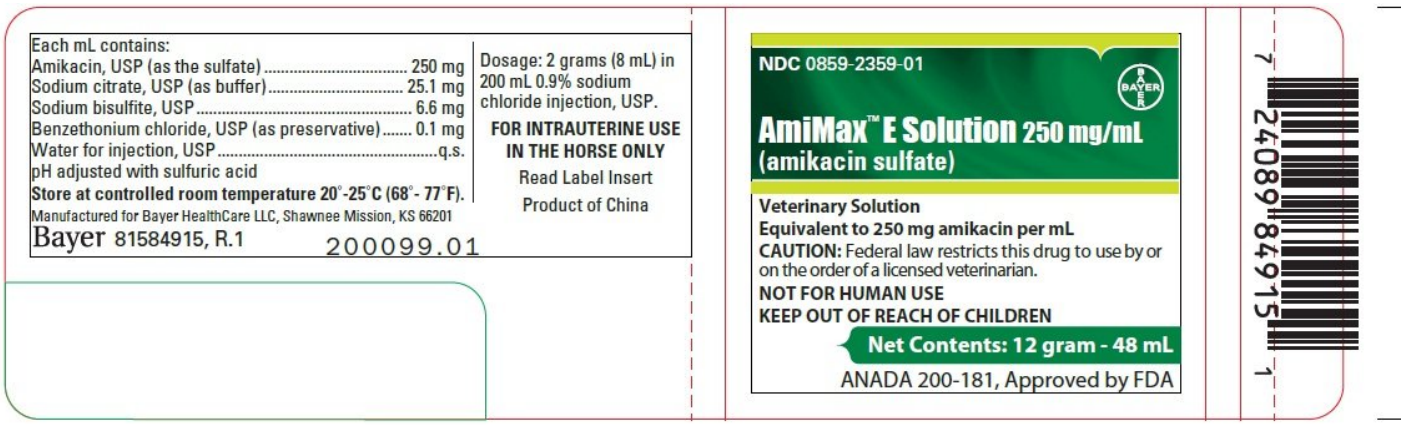
REFERENCES

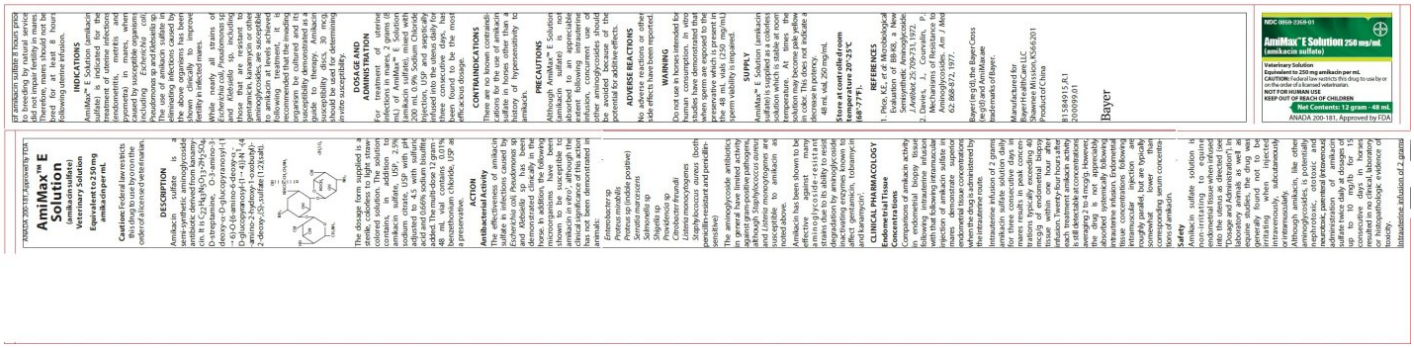
1. Price, K.E., *et al*: Microbiological Evaluation of BB-K8, a New Semisynthetic Aminoglycoside. *J. Antibiot.* 25: 709-731, 1972.

2. Davies, J., Courvalin, P. Mechanisms of Resistance to Aminoglycosides. *Am J Med* 62: 868-872, 1977

PACKAGE/LABEL PRINCIPAL DISPLAY PANEL



Principal Display Panel



AMIMAX E

amikacin sulfate solution

Product Information			
Product Type	PRESCRIPTION ANIMAL DRUG	**Item Code (Source)**	NDC:0859-2359
Route of Administration	INTRAUTERINE	**DEA Schedule**	

Active Ingredient/Active Moiety		
Ingredient Name	**Basis of Strength**	**Strength**
AMIKACIN SULFATE (UNII: N6M33094FD) (AMIKACIN - UNII:84319SGC3C)	AMIKACIN	250 mg in 1 mL

Packaging				
#	**Item Code**	**Package Description**	**Marketing Start Date**	**Marketing End Date**
1	NDC:0859-2359-01	48 mL in 1 VIAL, GLASS		

Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANADA	ANADA200181	11/25/2014	

Labeler - Bayer HealthCare LLC (152266193)

Revised: 3/2015 Bayer HealthCare LLC